NASAfacts

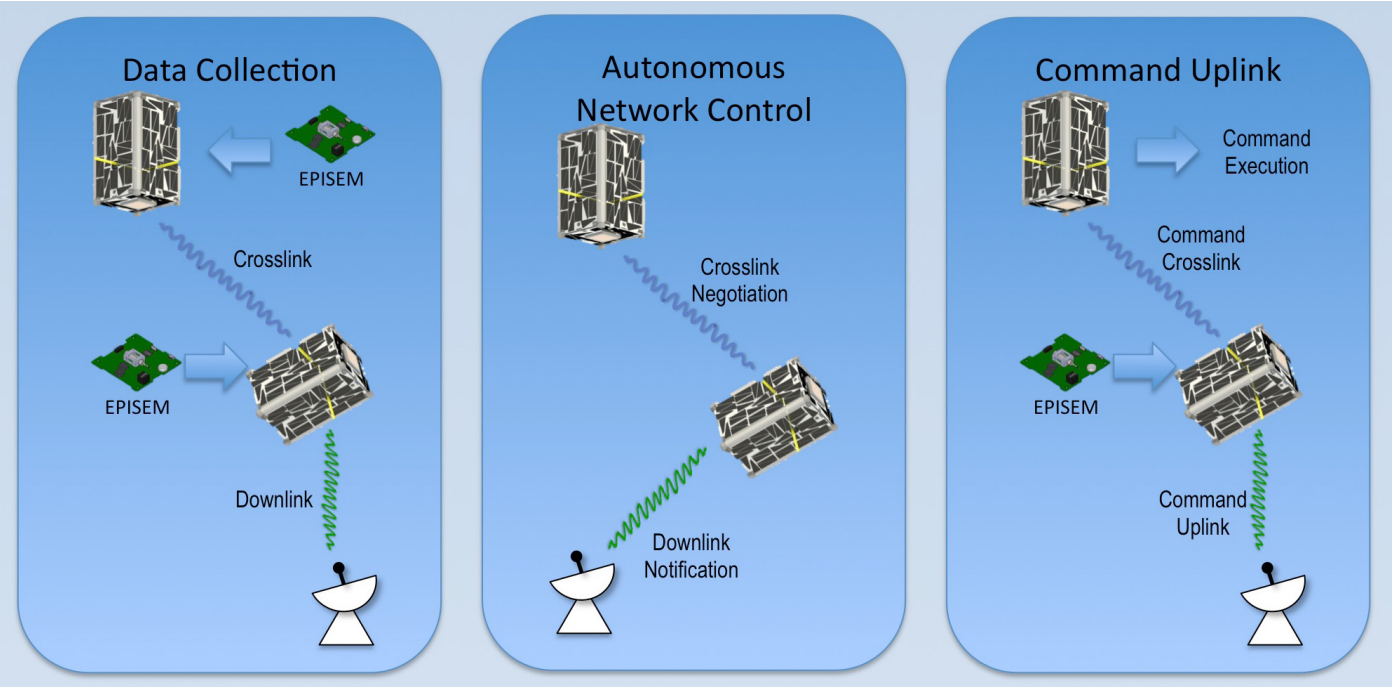
Nodes

Nodes is a technology demonstration mission that will launch from the International Space Station (ISS) in late 2015 and will demonstrate new network capabilities critical to the operation of swarms of multiple spacecraft.

Nodes continues the legacy of the PhoneSat series of small satellites that first introduced and successfully implemented the use of Android Smartphone technology to perform many of the spacecraft functions previously accomplished through custom technology development efforts.

The Nodes mission consists of two 1.5- unit (1.5U) nanosatellites each weighing approximately 2 kilograms (4 pounds) and measuring 10 centimeters by 10 centimeters by 17 centimeters. The Nodes spacecraft are derived from the hardware and software developed for the EDSN mission (a swarm of eight 1.5U spacecraft). Each Node utilizes the Android operating system with specific software programmed to perform command and data handling tasks that allow the satellites to 1) relay ground commands through one satellite to the second satellite, 2) collect and relay science data on the radiation environment in the ISS orbit from each satellite to the ground station, and 3) autonomously determine which of the two satellites is best suited to control the space network and relay data to the ground ("Captain") and notify the ground system and second satellite ("Lieutenant") of the result. The science instruments on each satellite will collect data on the radiation environment at an altitude of 400 kilometers (km) above Earth. These same instruments will be utilized for the EDSN mission, collecting

Nodes Spacecraft Assembly Sequence



Nodes Inter-Satellite and Space-to-Ground Communications Concept of Operations

data in a different orbit.

Nodes is planned for launch to the ISS in late 2015. The two Nodes satellites will then be deployed in orbit from the ISS.

The Nodes mission duration is approximately two weeks with orbital life reaching six months.

Nodes is funded by the Small Spacecraft Technology Program (SSTP), one of nine programs within NASA's Space Technology Mission Directorate, and the Engineering Directorate at NASA Ames Research Center. The SSTP develops and matures technologies to enhance andexpand the capabilities of small spacecraft with a particular focus on communications, propulsion, pointing, power, and autonomous operations.

For more information about the SSTP, visit:
http://www.nasa.gov/smallsats

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